# THE OPTICAL
# MAGIC LANTERN
# JOURNAL
# AND
# PHOTOGRAPHIC ENLARGER.

EDITED BY J. HAY TAYLOR.

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## CONTENTS.

| | PAGE |
|---|---|
| Notes | 39 |
| A Folding Tripod Head for Camera or Lantern | 40 |
| To Convert a Blow-through into a Spirit Jet | 41 |
| Modern Optical Illusions.—VII. | 41 |
| The New Light, Incandescent Gas | 44 |
| Stereopticon Cyclorama | 45 |
| Simpson's Automatic Lantern | 46 |
| Lantern Etiquette | 47 |
| Is the Lantern Played Out ?—No.—No. II. | 49 |
| New Apparatus | 50 |
| Editorial Table | 51 |
| Patent Intelligence | 52 |
| Correspondence | 53 |

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## Notes.

On the 11th ult. an invitation visit was paid by the members and friends of the Lantern Society to the works of Brin's Oxygen Company, which was very much enjoyed. The manager, Mr. K. S. Murray, explained in detail the processes of manufacturing oxygen, and the plant used in doing this. The operations of compressing the gasses and filling cylinders were then shown, and the uses of oxygen for blow-pipe work, lime-light, &c., practically demonstrated. After inspecting the annealing furnaces, laboratory, fitting shop, &c., and the various sections of cylinders used, together with the valves, regulators, &c., generally supplied, Mr. Murray showed and explained the operation of cylinder testing, and went into the question of the precautions taken for the public safety in passing cylinders for commercial use.

* * *

We have received a letter of complaint from a lanternist who had a somewhat strange experience at the Bath Station of the Great Western Railway. His luggage was refused on the ground that it looked like lantern gear. On stating that this was precisely what it was, he was informed by the receiving porter that some passenger had had lantern gear damaged in transit, and had claimed compensation, and orders had been given that such should not be conveyed as passenger's luggage. The legality of such a proceeding is perhaps questionable; but, then, who would go to the expense of fighting the company to ascertain that? Travellers soon get to know, when they have the choice of two lines, which gives them the best treatment, and they generally book according.

From June 29th to July 6th in conjunction with the International Tobacco Trades Exhibition, to be held at the Agricultural Hall, N., an exhibition of unframed photographs will take place, the entry fee will be one shilling a print, and certain prizes will be awarded. Mr. W. D. Welford, 59, Chancery Lane, is the general manager of the photographic section.

* * *

The Royal Photographic Society, which became incorporated on the 1st January in this year, have determined that the Society shall hereafter consist of two classes, Members and Fellows. In future, no members will be admitted to the fellowship until they have given the Council satisfactory proof of the possession by them of suitable qualifications for the title F.R.P.S., which in this way will become a guarantee of distinct ability on the part of its holder in either scientific or artistic photography. The large accession of members to the Society within the past few months has rendered its migration to larger and more convenient premises imperatively necessary, and the Council have this matter now under their consideration.

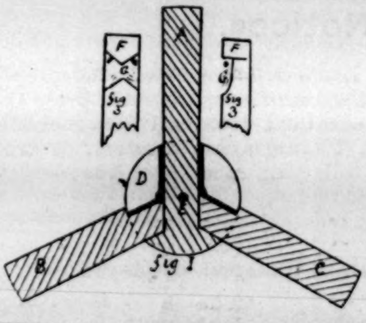
* * *

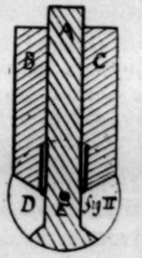
An important photographic case was lately decided at the Brentford County Court. It appears that Messrs. Theobald & Co. sued Messrs. Thomas, of Acton, for the wrongful conversion of negatives belonging to the Plaintiffs. Previous to selling their business to Mr. Walter Tyler, Defendants had been in the habit of making lantern slides for the Plaintiffs from drawings or pictures submitted to them, at a certain price per dozen, and in order to do so they had first to make negatives, and these negatives were transferred to the purchaser with the business. So as to get control of these negatives, the Plaintiffs paid the purchaser of the business £11 1s. 5d., and it was to recover this amount together with damages for loss through detention that the action was brought. Several witnesses were called to prove that according to the custom of the trade, the negative under these circumstances remained the property of the owners of the pictures from which they were copied. It had been held that in the case of portrait negatives upon actions for injunction that the holder could not use them at his will, but had never been ordered to give them up, so His Honour, Judge Bagshaw, said that this looked as though they could not enforce such an order. After the hearing of much evidence it was stated that it was evident a special agreement had been made in this instance, and that the purchaser of the business could have supplied slides from the negatives when required by the Plaintiffs. His Honour found for the Defendants, as he failed to ascertain that there was any custom in the Plaintiff's trade different to that in the general photographic trade, where the negatives were held by the photographer, though he could not use them as he chose.

——:o:——

# A Folding Tripod Head for Camera or Lantern.

The order of the day seems to a certain extent to make apparatus go into as small a compass as possible, and as we have never before seen an account of a particularly neat form of head, which we have had in use for several years past, we submit the same to our readers. As a great many lanternists have of late taken to tripod stands for their lanterns this form may be useful to them, and as for camerists, it will doubtless be hailed with a certain amount of delight. The wood portions are formed of tough three-quarter inch wood, the central one A, Fig. 1, being six inches long. The extreme length of the other two arms B and C is four and three-quarter inches. The lower end of A must be made in the form of a butt, as shown. The portions B and C are fastened to A by means of hinges, one side of which should be well insetted; D, a circular brass plate is fastened to A, by means of a couple of screws and a hole drilled, as at E, so as to enable the lantern or camera to be secured. This little apparatus may be folded up as shown in Fig. II., when it will be found to measure 6 × 2½ × ¾ inches, not a large package to carry in the breast pocket of one's coat. The mode of fastening the stand to this head will be at once understood from Fig. III. A brass piece F. containing two peg projections, is fastened to the end of each arm for the purpose of holding the ends of the legs of the stand.





# To Convert a Blow-through into a Spirit Jet.

THERE are times when one has neither house gas from the mains nor compressed, at hand, and in order to assist those, Mr. G. W. Smith, of Bromley Common, has sent for reproduction the enclosed sketch, showing in what a simple manner an ordinary blow-through jet can be made to do service as a spirit jet when occasion necessitates. The idea Mr. Smith informs us should be credited to Mr. Thomas Gulliver, of Swansea, who was well known as a prominent lanternist in early years, and whose enthusiasm upon such matters has not forsaken him.

A small box, preferably of brass, is made so that it can be attached to the ordinary jet in such a manner that the wick of the spirit lamp will come in the right position with relation to the gas outlet of jet, the oxygen side of which alone is used, the hydrogen side being shut off. The oxygen tubing is attached to the oxygen side of jet, the spirit lamp lighted and adjusted, a small quantity of oxygen turned on, and everything is ready. Mr. Smith expressed the hope that some of the dealers in lantern apparatus would put something of this kind on the market, as he, personally, has found it of such benefit, that he is confident that if the lamp were produced at a reasonable price, that most users of blow-through jets would avail themselves of the opportunity of thus making their outfit more complete.

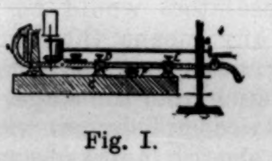


Fig. I.

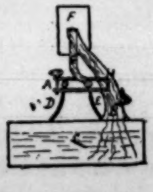


Fig. II.

In Fig. I. (A) is an ordinary blow-through jet, (B) chamber containing the wick, (C) the box or spirit lamp to contain six ounces, which is supported on the jet tubes by the screw clamps (D) and (E). The lamp is charged with methylated spirit at (F).

In the sectional sketch (Fig. II.) the reservoir is shown at (C), the wick chamber at (B), the connections between lamp and clamp by (B) and (E), and the clamp itself by (A). This clamp is hinged at (H). The lime, as will be seen, is marked (F).

# * Modern Optical Illusions.— No. VII.

By EDMUND H. WILKIE,

*Of the late Royal Polytechnic Institution.*

(*Continued from p.* 35.)

MR. T. TOBIN, one of the inventors of the "Decapitated Head" illusion, was, I believe, the inventor of "The Sphinx" exhibited by Colone Stodare with so much success. It represented a living head supported on a small three-legged table, and was identical with the Decapitated Head.

Another method of using this illusion was exhibited at the old Polytechnic in an improved form. In this case the head was simply supported upon a short and slender pillar, the mirrors being without frames and placed as in Fig. XIX. These edges, as I have before explained, were bevelled; but Mr. Walker, the inventor of Metempsychosis, has devised a much better plan than this for rendering the edges invisible. The small illustration, Fig. XXI., will almost explain itself, (A) is the plate of silvered glass, the extreme end of which (B) it is desirable to render invisible. Mr. Walker fastens a narrow strip of glass, half of which overlaps the end of the main plate, right down its edge. This narrow strip is not all transparent, the shaded portion at (E) being silvered at the back, and as it reflects the side of the apartment in the same manner as the mirror (A), the edge is practically annihilated and is quite invisible to the spectator at (F).

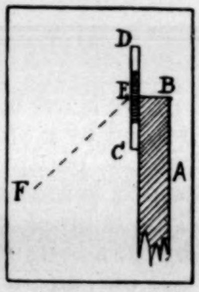


Fig. XXI.

So important and striking are the results which can be obtained by the use of this invention that the inventor has protected it by law; I should mention in this connection that although the name of Professor Pepper was coupled with that of Mr. Walker when Metempsychosis was first produced, I have since been informed on the best authority that the merit of the invention rests solely with the latter gentleman, he having completed it ten years before it was produced in public.

I purpose now dealing with a class of optical illusions know as spirit manifestations, but wish it to be clearly understood that all the effects I shall describe are simply stage tricks, and are not put forward in explanation of the mysteries described by spiritualists, although they were originally no doubt designed to to imitate those phenomena. I wish to be perfectly plain and explicit on this point, as my remarks might otherwise cause pain and offend many worthy persons.

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One of the commonest manifestations of the presence of a spirit is the appearance of spots of light either singly or in clusters, frequently floating round the room, and as this is the easiest motion to accomplish by mechanical means, it is the most used.

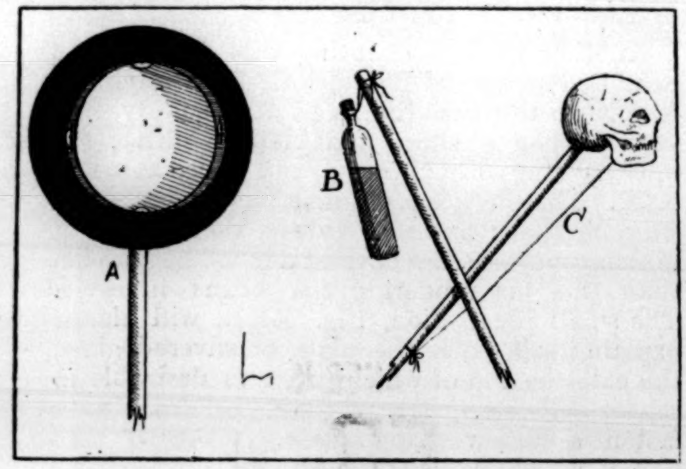


Fig. XXII.

The spirit light (B) Fig. XXII., may be represented by a small glass bottle filled with oil in which phosphorus has been dissolved, and which is attached to a long stick or fishing rod. This is brought out from behind the proscenium by an assistant after the hall lights have been put out, and is made to float slowly round about and up and down over the heads of the audience.

The best method of working these lights is to bring them forward, not one by one, but in a bunch of ten or twelve, and the light emanating from them is so undefined in shape that they do not appear as a bunch of lights but as one single nebulous-looking mass. Each single light can then be carefully detached from the main body, and as they float away in all directions the effect is very striking. In these movements much depends upon the care and skill exercised by the assistants, as the luminous objects if moved too quickly would at once, by their line of motion, put the spectators on the track.

Another object which is always effective is the spectre hand, which is usually manufactured from an old glove stuffed with cotton wool and tied to the end of a fishing rod after being liberally anointed with the luminous oil. During the course of an entertainment at which the writer was present, one of the audience rose from his seat and made a dash in the dark at the spirit hand with one of those walking sticks with a large crook on the end, so much affected by "Mashers" at times, with the result that he hooked the pole, and, his stick sliding down, pulled the glove off the end, exposing the trick.

With regard to the luminous substances with which these objects may be coated, the two mostly in use are, 1st, oil impregnated with phosphorus, 2nd, Balmain's luminous paint. I have had considerable experience in the use of this paint for entertainment purposes, and have always found it act in a most satisfactory manner. The best method is to prepare the objects we wish to render luminous by painting them with this paint, and when required for use have them arranged along the wall in a room off the platform, and cause an assistant to travel backwards and forwards along the line with a magnesium lamp so that they absorb plenty of light, and are rendered thoroughly luminous. If exhibited shortly after this treatment they are very brilliant, shining with a light resembling the phosphorescence of the sea.

Tambourines, (A) Fig. XXII., can be treated in the same manner as the lights and hands and form a good accompaniment to them, as a slight shake produces that jingling sound with which we are all familiar.

It will be noticed that these luminous objects would be apparent to the audience the moment they were brought into the hall or theatre, but in order to avoid this they should be kept closely covered with a cloth until required for exhibition.

It occurred to the writer that the effect upon the minds of the spectators would be much more striking if by any means the luminous appearance could be caused suddenly when the objects were at a distance from the stage. This would be very easy of accomplishment with the modern incandescent electric lamps obscured to the proper pitch, but the travelling lecturer would not always find it convenient to carry batteries of sufficient power together with the necessary chemicals for working them, so I devised the following arrangement:—Each object we wished to send round over the heads of the audience was fastened to a circular piece of card coated with dead black, and sufficiently large to extend beyond it for several inches all round, as in (A) Fig. XXII. When brought into the hall the black backs were religiously kept towards the spectators, and in that position were projected outwards into the auditorium when a sudden turn of the rod reversed the whole arrangement, and the luminous objects were visible to those sitting beneath.

In a hall where plenty of space is available, floating forms of a nebulous appearance can be caused to appear, and travel outwards over the heads of the audience, and also to take one of the exhibitors by the hand, and, raising him from the floor, to glide through the air across the stage and put him down on the other side.

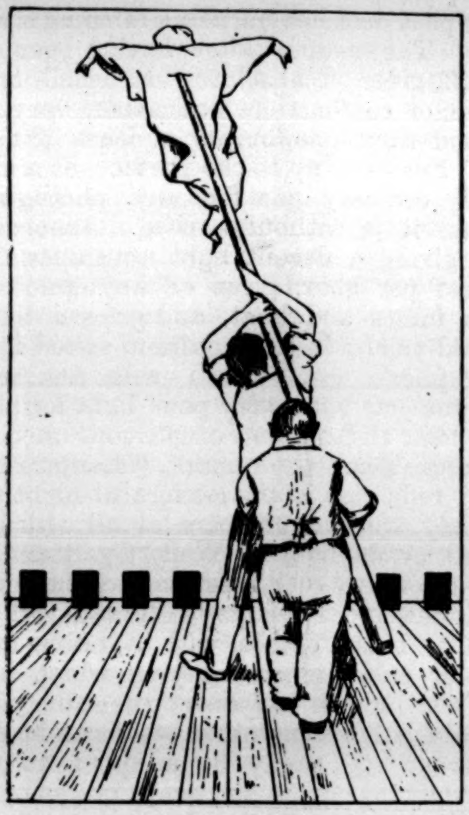


Fig. XXIII.

This must necessarily be accomplished in utter darkness, and to avoid detection and to keep secret our means of operating it is usual to turn the gas quite out. By arranging a small Rhumkoff coil in connection with the sun burner in the ceiling of the hall, the gas may be instantly lighted or put out from the main, a very necessary arrangement in all performances of this character.

Those who are familiar with stage properties will understand that the form of the spirit can be made in light wicker work to cover the front of the body and head of the performer (no back is required) which frame can be draped with material prepared with the luminous paint. When required for exhibition it is first exposed to the rays of the magnesium lamp, and then being fitted on to the performer the spirit makes its appearance and glides about the stage where required; but now, how is it to float in the air over the heads of the audience. The means of accomplishing this effect is so simple as to verge on the ridiculous, there are no complicated pieces of apparatus required nor are the accessories expensive.

The person representing the spectre disengages himself from the basket framework, being assisted by others, who, taking care to keep behind the luminous figure, are of course invisible, and proceeds to fit our old friend the long pole into a socket provided in the frame, after which, the spirit form is slowly elevated Fig. XXIII., at the same time being allowed to move outwards over the heads of the spectators. This needs care, as the pole must be kept quite out of the reach of walking sticks and any structural obstacles which may be present.

Some years ago I read in one of the London daily papers an account of an exhibition in Blackburn, given by a company, the head of which was a lady said to possess considerable power as a medium. It would appear that the previous effects had not given unqualified satisfaction, and when the materialized spirit form which should have floated from the stage over the heads of the audience to the end of the hall and back again showed signs of getting tired almost as soon as his journey had commenced matters came to a climax. Some persons shouted for the gas lights to be turned up, others tried to "hook" the figure, which in turn became violently agitated as one might naturally suppose under such trying circumstances, and at last down it came on to the heads of the audience below.

The gas was turned up, and it was discovered that the "spirit form" consisted of a light framework covered with cotton wool, made luminous by chemical means. A wire had been quickly stretched from end to end of the hall directly the lights were lowered, and the figure being slung on this should have travelled along when pulled by twine, I may sum up the subsequent proceedings by saying that the ghost was laid for ever so far as that company was concerned.

The wire is not to be compared with the pole in my estimation, as a means of raising the figure, and is always a source of anxiety, while the pole on the other hand is only brought forward when required, and taken right away immediately afterwards.

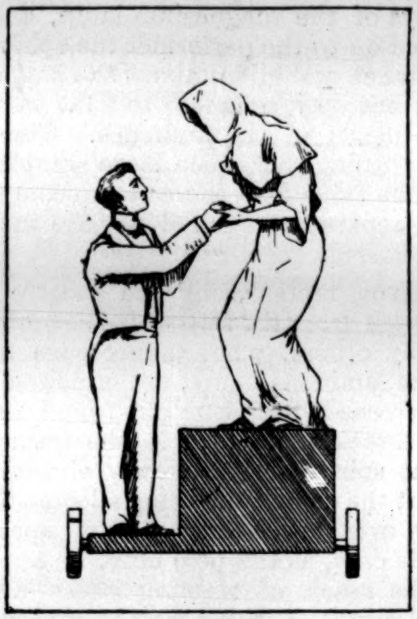


Fig. XXIV.

The illusion of the spirit form taking the hand of one of the performers, and, after raising him from the ground, gliding with him across the platform and depositing him on the other side, is puzzling, but simple. The whole secret lies in the fact that the luminous figure stands upon a small carriage about three feet in height, moving smoothly on four wheels with rubber tyres. On the side of this carriage next the audience is a step, on to which the performer gradually raises himself one foot at a time when being apparently lifted by the luminous figure. Once there, the whole affair is wheeled by an assistant right across the platform from one side to the another, and as the place is in darkness, and the actor is only visible to the audience on account of being in front of the luminous figure, none of these manipulations Fig. XXIV. can be seen, the general effect only being apparent.

:o:

## The New Light, Incandescent Gas.

By a Lanternist.

Without a doubt this illuminating power is much cheaper than any other form or method of lighting by combustion. It is now so well known that details of the burner may be somewhat old, but the following remarks may prove interesting, and I trust some may derive as much pleasure from the use of this light as myself.

It is of the greatest value for photographic purposes, the light being very white and very rich in blue rays. Having used same for over four years, in various forms, I can write with some little confidence that I have in it. The cost of the burner itself can be obtained from 8s. 6d., which has no bye-pass; those with the lever bye-pass, at 10s. 6d., are much preferred, whilst there is another with lever bye-pass and chains at 11s. 6d. Those with the bye pass are always burning, the consumption of gas being about 3½ feet an hour, and I should think that the bye-pass does not burn one farthing's worth a day. The mantle after having been once burnt off, gives off absolutely no smell, or any products of combustion noticeable, very little heat, and from one burner at least 50 candle power. I can say up to the present, as a means of using ordinary gas for any photographic purposes, it is without a rival. An ordinary burner, giving a decent light, consumes 5 feet or 6 feet per hour, gives off any amount of noxious fumes and heat, and gives a light so weak and yellow as to be quite unsuited for the photographer's use. Even with an Argand burner one gets but a very poor light for all the intense heat and amount of gas consumed.

One often hears the remark, "Lantern slides made by reduction in the camera at night time. Why, they will not compare at all with slides produced by daylight." Well, try it and see, and for the future such a remark will be without any foundation. I am perfectly satisfied with the results I can obtain with it, either for reduction or enlarging, or copying, which by its means the light is always of the same power, and available when no other work can be done. The burner can easily be adapted to most ordinary arrangements for lamps or gas enlarging. All that has to be done is to fix the burner in the place of the lamp behind the condensor. As the incandescent mantle is very fragile, it is best to have the burner a fixture, but if moved about, care in carrying same is all that it is needed.

For painting at night one can do colour work, that no one would have done unless without an electric light. If one finds that the ordinary glass chimney should crack, which they are liable to do, if exposed to draughts of cold, use a mica one instead, the reduction of light is very slight. I have omitted mentioning its use in connection with the lanterns for showing slides (transparencies); it is for a small disc, say 5 feet or 7 feet, very decent, but for that purpose the light is too large in body; it wants to be more perfect, smaller in fact as that obtained from a lime.

# Stereopticon Cyclorama.

By Charles A. Chase.*

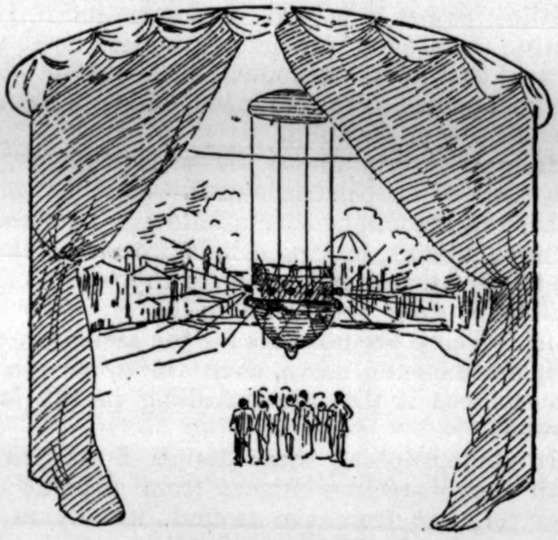
When I was a boy the toy magic lantern was to me a most wonderful instrument, and I was not happy until I possessed one. It was the greatest wonder to me how the small slides could produce such large pictures on a screen. As I grew older the interest in magic lanterns and stereopticons did not leave me. Whenever the opportunity presented to attend stereopticon entertainments I would go. Several years ago while at a stereopticon entertainment the thought occurred, "Why is it not possible to show something more than the scope of the ordinary picture. Why not widen so as to get a better idea of the topography of the country, especially in a scene where a deep ravine or high mountain is shown? Why could not two or more stereopticons be used and join two or more pictures side by side, the same as photographs are joined?" I tried it with success, and that was the stepping-stone to the evolution of the instrument illustrated herewith, which I have called "The Chase Stereopticon Cyclorama," a concentrated battery of stereopticons, which not only joins two pictures, but enough to form the complete horizon.

In the meantime I gave to photography some attention, and found to my discouragement that the ordinary camera was not the instrument to produce suitable pictures for the best cycloramic effects, and therefore the development of my instrument was delayed a good while; but the idea was captivating, and after many further attempts to secure a cycloramic photograph, using the ordinary camera, I tried first the Cylindrograph, manufactured in France, and afterward the very ingenious camera invented by Percy S. Marcellus (photographing the complete cyclorama in one sweep). Mr. Marcellus very kindly loaned me the negative of the Court of Honour, and from that I made the stereopticon slides used in public demonstrations of August 24th and 27th, 1894, of "The New Cyclorama Idea" given at the Chicago Fire Cyclorama Building.

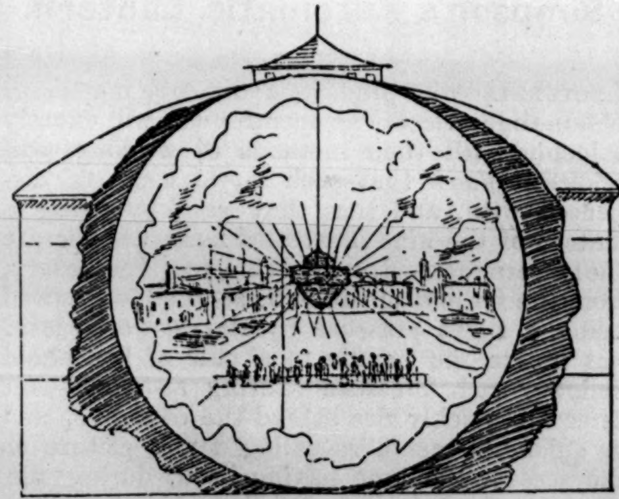
The screen is cylindrical in form, although I intend using a spherical-shaped wall in large permanent buildings for especially grand effects, for showing bird's-eye views, which will bring the foreground closer to the spectators.

The screen for the pictures can be almost any size; from 20 to 50 feet high, and 50 to 100 feet in diameter. Perhaps practical stereopticon men may limit me as to size of pictures to 30 feet, but I can produce double the size with my blending attachment.

The instrument is hung from the ceiling like a chandelier, and fastened rigid by the use of iron pipe and cable stay wires. It weighs about 600 pounds, occupies a space about 6 by 6 by 8 feet, and is quite an intricate piece of mechanism, with its dissolvers arranged on a disk, and each working independent of its neighbour, but all movements from and radially around the centre. It necessarily has to be very accurate, as a movement of a hair's breath might be three inches on the screen.



Interior View.



Sectional View.

All movements of the dissolvers are made with thumb screws, and when adjusted, are set solid with set-screws before the performance commences. There are blending attachments for making joinings with set-screws, so that the picture is a homogeneous cycloramic scene without possible discovery of points of joining. The pictures are coloured by the "Nature Process," the invention of David P. Breed, of Pittsburg, Pa., and when thrown upon the screen the effect is even more grand than the cycloramic paintings seen about the country. An electric lighting power of 25,000 candles is used in projecting the scenes, and photographers need not be told that details are much more perfect than the best painting ever produced, and with colours the effect is enchanting.

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* "Wilson's Photographic Magazine."

In one entertainment the scene changes by the turn of an electric switch—daylight, sunlight, and moonlight effects follow in succession—moving boats, moving clouds from real cloud negatives—search lights appear to make it more real (supposing the scene to be the World's Fair). There are no seats for the audience, the people are on the move, they are a portion of the scene as if they are travelling in the land viewed.

In photographing these scenes I take them with the Marcellus camera from a point not over ten feet from the ground, usually in an open space, for foreground effects, trying to imitate the view naturally taken in by the eye. Therefore when the scene is projected upon the screen the floor upon which the spectators stand runs right off into the scene, and it is so real that it seems as if we could step right out into the country viewed.

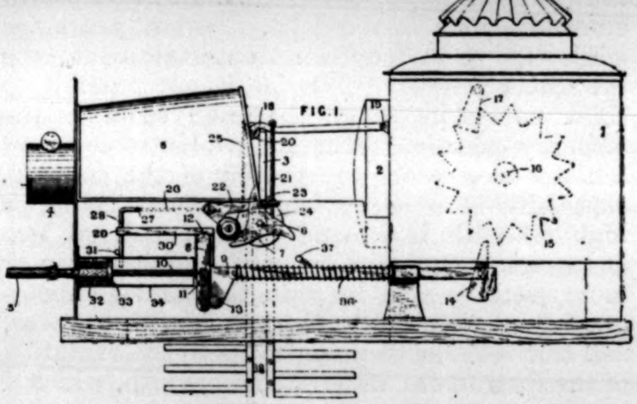
———:o:———

## Simpson's Automatic Lantern.

Lecturers who find it a difficult matter to obtain the services of an operator who will exactly coincide with their methods of working, will rejoice to know that such services can be dispensed with, and that they can, by using a lantern of the kind illustrated herewith, operate the lantern themselves, and this, too, if necessary, from the far end of the hall, all that is required being a slight pressure by the foot on a lever not unlike the handle of a pair of household bellows, such pressure causing an opalescent screen to quickly rise behind the objective, and as quickly descend, revealing a new picture on the screen, the lime having been, during the moment of obscurity, slightly rotated. This ingeneous lantern is the invention of Mr. Simpson of Liverpool, who has lent it to us for exhibition in our office where it now stands, and may be inspected by appointment. The tubing connecting the lecturer with the lantern is filled with water, and the slides are placed in the endless carrier 38, in which they are held by springs.

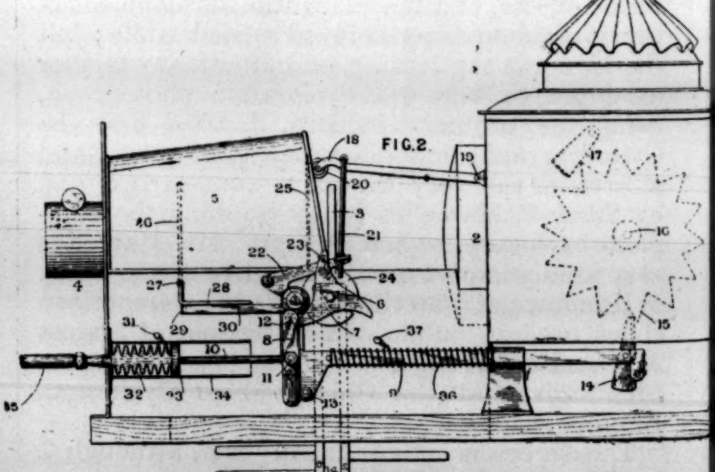
The mode of action will be readily understood from Figs. I. and II., the former representing the instrument during the time that a picture is on the screen, and the latter the action of changing the slide. In both the drawings, the same parts are indicated by the same figures of reference, and the cylinder in which the piston works and the bellows are shown in section.

FIG. I.



1 is the lantern; 2 condenser, so modified that the normal position of the slide 3 when properly illuminated is, as shown, some distance in front of the condenser. 4 the lens and 5 a hood covering in the space between the slide and the lens. 6 the triangular spindle carrying the chain of slide-carriers; and the ratchet wheel 7 which operates it has three teeth and moves through an angle of 120 degrees each time the slide is changed.

FIG. 2



The ratchet wheel is operated by the horizontal movement of the swinging pawl 8 carried on the bar 9 which is a prolongation of the piston rod 10; the pawl swings on the pivot 11, and as the piston is forced out, the arm 12 engages with the teeth of the ratchet wheel and rotates the latter, the pivotal motion of the pawl being limited by the stop 13 on the bar 9; on the return stroke of the piston it will be seen that the pawl in passing the ratchet wheel merely swings on its pivot without operating the ratchet wheel. A similar swinging pawl 14 on the bar 9 operates a ratchet wheel 15 at bottom of lantern which intermittently rotates the lime spindle 16, and a detent 17 is fitted to the ratchet wheel 15.

18, a movable abutment which swings from pivot 19; the parts which come in contact with the top edge of the slide, as shown in Fig. I., consist preferably of two rubber edged rollers 20. The abutment is operated through a rod 21 by the two armed lever 22 which is raised by the arm 12 of the swinging pawl as it passes, prior to operating the ratchet wheel, as shown in Fig. II. The lever 22 also serves as a detent lever for the spindle 6, as it is provided with a pin 23 which engages in the notches formed in periphery of the detent wheel 24 fixed on the spindle 6; the raising of the lever 22 by the swinging pawl 8 before the latter operates the ratchet wheel 7 also serves to release the detent.

25 is a mask which serves to intercept any rays of light passing from the condenser outside the slide.

The dissolver 26 is pivoted at 27 and is linked to the piston by means of the bent arm 28 which engages with the hooked portion 29 of a spring 30 carried from the rod 9. It is operated as follows:—When the piston is at the beginning of its stroke the hook 29 engages with the longer portion of the bent arm 28, as shown in Fig. I., and, as the piston makes its outward stroke, the dissolver is closed, as shown in Fig. II., before the slide 3 begins to rotate. The dissolver remains closed (in consequence of the longer portion of the bent arm 28 being supported by the hook 29) whilst the spindle 6 is being rotated and the slide changed; when, however, the next slide is in position and the piston completes its outward stroke the hook 29 will have passed from under the arm 28, the latter will, therefore, fall by gravity and the dissolver will be opened. When the piston returns, the hook 29 again engages the arm, as the latter is prevented from turning by the stop 31 and the spring 30 yields laterally.

The piston is operated by the pressure within the cylinder in the usual way and water pressure is used, it being confined within a bellows 32, of which the piston 33 forms the end, the cylinder 34 serving merely to guide the piston. A bellows or ball is used by the operator at the other end of the flexible tube 35 to produce the necessary pressure. The piston is returned to normal position by the spring 36 and its motion is limited by the stop 37.

Assuming that the slides are placed in the chain of slide carriers in their proper order and that the first slide is in proper position for projection, the piston being at the beginning of its stroke, the action of the apparatus, when it is desired to change the slide, is as follows:—

The lecturer, who may be at the far end of the hall, produces a pressure in the fluid, the effect being to propel the piston and the bar 9 outwardly, the dissolver is closed and the swinging pawl engages with the roller on the lever 22 thus releasing the detent and raising the movable abutment; and spindle 6 is next rotated through 120 degrees, bringing the next slide into position, the latter being located exactly by the abutment, and, as the piston reaches the end of its stroke the dissolver is opened; in the meantime the pawl 14 has operated the lime spindle. On releasing the pressure the spring 36 returns the piston to its initial position.

——:o:——

## Lantern Etiquette.

By Rev. John St. John.

My Readers who scan these lines will be unanimous in their opinion, that the title of the article is somewhat misleading, and that the adverb—non—should have been prefixed to the word "Etiquette," thus inferring its exact opposite. For its in the want of good taste, judgment, and manners, that the writer is about to speak.

The appellation in the present case is aimed solely at the so-called lecturer, or, if you prefer an Americanism, "the boss of the show," he being wholly responsible for the trust in its entirety he has undertaken to fulfil.

Professionals and amateurs there are (and always will be) in all callings, the lantern with its endless charms, varieties, and beauties, being no exception to this rule; indeed, it takes a most prominent place in the foremost ranks.

The professional man wants none of your puff! while the amateur doesn't mind being crammed with it, which is pardonable to a very great extent in consequence of his not having had necessary tuition, so essential to all success.

Nearly everyday we see or hear of really good work having been blurred or spoiled by some slight indiscretion on the part of the master of the ceremonies saying something altogether out of place, and, if not quite offending his audience, at least gives that body an insight of his ignorance. What is worse than sitting in front of a man who is incapable of uttering a single extempore paragraph on his subject, and who, between the dull and belaboured sentences he indifferently reads, is audibly grumbling and finding fault with the operator at the lantern, when there is nothing at all wrong, excepting his own incompetence.

The writer was present just lately at an exhibition, and heard a complete and good lecture, capitally arranged and carried out, but which was gravely marred by a breach of professional etiquette on the part of the lecturer, one of the latest of recruits.

The literary society of the parish church at A——, were arranging their syllabus for the ensuing session, when it happened that Mr. B——, an influential member of the committee was anxious to try his hand as a public lecturer. A difficulty presented itself (not an unusual thing). He not having the slightest knowledge of lantern matters was in a fix as how best to get his subject illustrated. C——, a fellow committeeman came to his assistance, promising to confer with, and if possible get the professional aid of his friend D——. Professor D—— consented, and a date was fixed to fit in with his engagements. He relieved the committee of much anxiety by providing the necessary requirements at his own expense:—viz, the entire lantern outfit, with the exception of course of the slides, these latter were to be handed to him on the night of entertainment in their order of running, and which were to be the recognised standard 3¼in. size.

A big crowd assembled; the fit up was perfect. The lecturer commenced and proceeded with smoothness till half way through, when D—— discovered a couple of slides that would not pass into the carrier grooves; our operator at once knew they were foreign make, and immediately sent an intimation to the lecturer to pass over Nos. 37 and 38. Things went off with every success, and the lecture finished, met with much approbation.

Imagine the operator's disgust, however, when he heard the lecturer apologise to the audience (in his reply to the customary vote of thanks), for not having shown them two slides as intended, and which had been omitted by Professor D—— for some unknown reason. D—— pocketed his disdain as best he could, but the audience could not hide theirs, and crowded round him whilst the packing up was being proceeded with, congratulating and thanking him for the enjoyment he had given them.

Contrast the two following means of correcting an error. A slide is inadvertantly put in wrong way up.

"There you go, Careless," says Mr. Inexperience.

"That, ladies and gentlemen," says Mr. Experience, "is the way we used to show this slide, and this—(pauses while the slide is reversed)—is the way we show it now."

Reader, which is the better of the two?

Another want of good taste suggested itself to the writer's mind on reading some short time ago the report of an evening's proceedings at one of the large societies devoted to the interests of the lantern. A well-known expert accepted their invitation and gave an evening on the most interesting subject connected with the optical lantern of the present time, and "so engrossed were the whole council," says the report, "that not a single member thought of thanking their benefactor with the usual vote at the close." Such discourtesies as here mentioned, are perhaps more prevalent in the lantern world than in any other form cf lecture work. Too much stress is laid upon the screen, so that when the (generally young) lecturer comes to front a concourse of people with anything but the stereotyped reading, he is lost.

Lantern readings, by-the-bye, are excellent in their way, but they should be confined as much as possible to home purposes. I maintain that an 1895 audience do not want to be read to, and to deceive oneself that they do is but casting a slur on their intelligence.

A short time ago a friend consented to work the lantern in a town some seventy miles from London, to oblige a musical luminary of the locality, the views were intended, I believe, to demonstrate certain incidents in a cantata. Everything was supposed to be in readiness. Everything *was* in readiness—er—that is to say, *all but the bottle of oxygen*, this arrived the day after. Result, no lantern effects. The refrain of an old song is suggestive, "It makes a man look such a fool."

Illustrations of this "Want of Etiquette" could be repeated *ad lib*, but if the above few lines have hit home in any particular, the object in the writing has been achieved.

**"Among the crowd many caps are thrown,**
**The one that fits you is your own,"**

# Is the Lantern Played Out? No. —No. II.

## PRACTICAL SUGGESTIONS.

By Amy Johnson, LL.A. (*Author of "Sunshine."*)

To return to the subject of how to interest those for whom the lantern was initiated, let me urge you to abandon all semblance of lessons or technique if you desire the children to come to your lectures. Don't choose a high-sounding title in the hope of stimulating curiosity, but rather go to the other extreme. For example, the announcement of a lecture on "The Tin Whistle" would bring in crowds of youngsters. And as this subject, though hit upon on the spur of the moment, occurs to me as probably one of the most difficult that could be selected for illustration, I propose to give a few hints as to how it might be dealt with. In so doing, perhaps some side-light may fall upon the method of tackling some easier subject which may suggest itself to the mind of the reader. How much or how little ground shall be covered in one lecture must depend upon the capacity of the audience, and the resources of the lecturer.

First, we must mark out a path for ourselves, along which we propose to travel, so that in selecting experiments the continuity of thought shall not be broken. Suppose it be something like this: — Introduction — vibrations. The pendulum—all elastic bodies, solid, liquid, and gaseous can be caused to vibrate—nature of wave-motion—all sounding bodies are in a state of tremor—how sounds are transmitted—use of sounding boards, etc.—simple description of the ear—distinction between noise and music—how vibrations are counted—resonance—principle of the flageolet, illustrated by series of test tubes—structure of flageolet, etc., etc.

### INTRODUCTION.

Begin with the tin whistle—don't keep it in the background until you've "led up" to it. Begin with it, for the sake of the *bona fide*. Show it them; play a tune on it—if you will. Then, attaching the mouth end by a tube to the water supply, stop the highest hole with sealing wax; immerse the whistle in a glass jar of water, and, after providing for the overflow, turn on the tap. Show them that the water also can play the whistle. A low musical note will be forthcoming on carefully regulating the flow of the water. This will put you on a good footing with your audience, and they will be quite ready to listen to an hour's experimental step-by-step illustration. It may be well now to lay the whistle in sight of the juvenile audience, remarking that we shall want it again in a few minutes, but you have something there you wish to show them first.

At home you will have prepared a little model thus—Into a heavy board secure two upright posts, which may be about a foot high, and over these attach firmly a cross-bar, and in it, at a distance of one inch or so from each end, make a hole, another also in the centre. The centre hole is for a common screw of wood or metal. Thread some fine white sewing silk through the holes and once around the screw. Now you will have, when you have knotted the end, a small swing, but first slip a small bead over ends of the doubled silk, and fix a small-jointed doll, about an inch in length, beneath the bead, tying it in a sitting position by the ends of silk. Then you will have to invent some story about the little girl in the swing. This apparatus is to be projected by the shadow method. Take out all the lenses from the lantern, and use the lime sharpened to a pencil point. Let the swinging take place in a direction parallel with the screen.

You will tell the children how the little girl came to be swinging there; then give the gentlest of pushes, just to set the swing in motion. This may represent the child's own efforts. The swing coming almost to rest, she calls out to someone about and asks them to give her a push (unsatisfactory). A younger child playing near gives some vigorous but irregular and ill-timed pushes, which result, despite well-meant efforts, in bringing the swing to rest. (A little practice will soon effect this.) Then an elder brother, sister, or father comes along, and by well-timed and regular pushes, succeeds in making the doll swing far out. These are skeleton notes which you will fittingly weave together. How the result is effected elicit from your audience. The points to be brought out—not told—are, that when the pushes succeed each other at regular intervals, and at the beginning of each swing-out, these impulses add themselves together; in this way the augmentation is very marked. It is well to spend time over this illustration, for upon the digestion of these facts depends whether you carry the minds of the audience with you through the succeeding experiments, or whether the children are simply spectators, in which case they won't enjoy themselves half so much.

Next, by turning the peg or screw at the top, shorten the strings, premising that "Lucy or Jennie" requested her father to make the swing higher, because her legs dangled on the ground.

The effect of shortening the strings is to make the swing move more rapidly, and offers scope for much fun. The point to be brought out is, that shortening the ropes *alone* will do this, the general impression being that a forcible push will do so with the previous conditions. Clear up this fallacy, and don't talk about swinging higher, but swinging further out, as the result of this augmentation by pushing. By getting the children to count, prove that whether the swing goes out a long or a short distance the *time* of swing is the same.

Having made the result of well-timed impulses clear, show what a power it gives. Quite a little boy is able to ring a massive church bell by adding his efforts together in this way when the rope swings lowest. Illustrate by suspending some heavy object—say a large scuttle nearly full of coals—as a pendulum. Very likely there will be an easel in the lecture-room, to the cross-bar of which you can tie the scuttle by the handle over the top. Now attach a piece of fine cotton to the small square handle at the side of the scuttle, and having ascertained by a push the period of vibration, which carefully note, bring the box to rest. Apply now (at the same rate) a series of feeble pulls to the cotton. At first the effect will be too small to be visible, but by degrees you will succeed in swinging it through an inch or so, which, when magnified in shadow upon the screen, will appear a considerable space, and, continuing, the augmentation soon rises to a foot or more. When this stage is reached, try to stop the box by pulling the cotton. The box won't be stopped. It has acquired a will of its own apparently; snap goes the cotton, and the box goes on its way as if nothing had happened, the real fact being that the strongest tug which you can exercise is only a very small part of the force which you have previously applied by successive instalments.

You will next briefly show that other bodies can be set swinging in a similar manner. Take water for an example. Call to mind how the children have stood on the bank of some peaceful pond, and dropping in a stone, have watched the round towers of water rise one behind another, and encircle it till the eye could follow them no longer. A simple experiment of great beauty can be introduced here, employing the vertical attachment or the sunshine lantern (Fig. LXV., Sunshine, which explains itself). That reminds me that someone asked in the Lantern Journal what he, who could not afford a vertical attachment, was to do. Extemporise one! For the plano-convex lens use a clock glass about 4 in. in diameter. For the lower one, say 5½ in. in diameter, cut off the round top of a glass shade. Support these glass dishes on corresponding rings of a retort stand, and fill them with distilled water, covering the upper one with piece of glass to keep out the dust. An ordinary looking-glass is placed below the basins at an angle of 45°. A larger ring at the top of the stand may have a velvet curtain secured to it to exclude stray light.

(*To be continued.*)

—:o:—

## New Apparatus.

### CHADWICK'S SCIENCE LANTERN.

In conjunction with Dr. G. W. Sidebottom, Mr. Chadwick has devised, and is now manufacturing, a lantern for scientific purposes, termed No. 2 B patent lantern. This instrument can be used for either ordinary projection, vertical projection, or for the polariscope. In Fig. I. the arrow shows it as being used for direct pro-

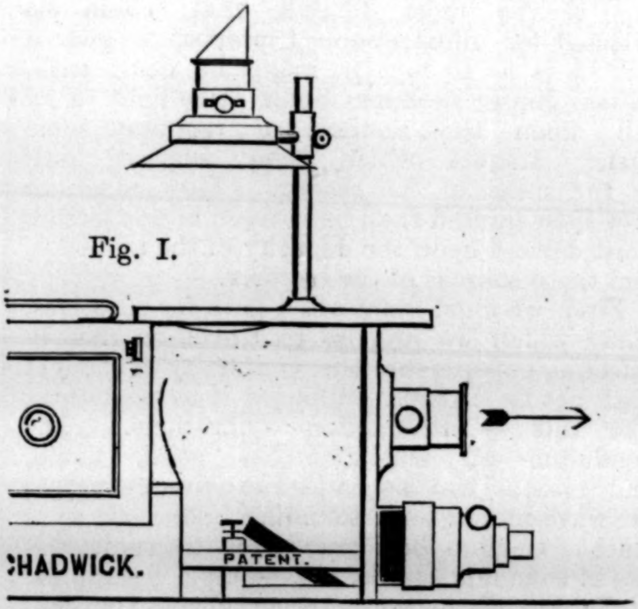


Fig. I.

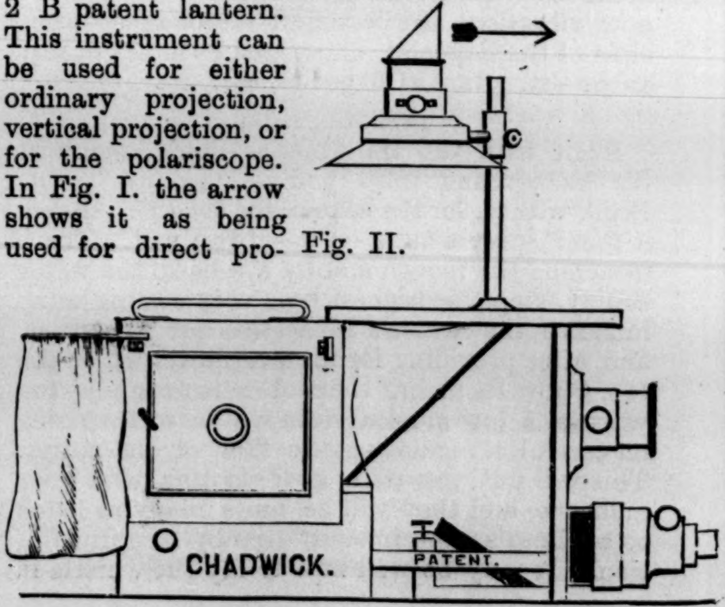


Fig. II.

jection. By merely placing the mirror in position as in Fig. II., it is at once ready for vertical projection; whilst by placing the mirror as in Fig. III., its use for polarised light is brought into play. These changes, as will be seen, can be made almost instantaneously as the same illuminant and condensers are used. The stage is left open, and is provided with springs to hold slides, tanks, etc., in place, but these can be quickly removed when required. The vertical attachment can also be removed and the lantern used without, and when occasion arises the polariscope stage and objective may be used in the position of the other lens. With a lantern of this kind standing complete the most fastideous demonstrator has every necessary change at hand, and these changes, as we said, can be made almost instantaneously, and lanternists in general are indebted to Mr. Chadwick or putting this complete apparatus upon the market. Those who are within calling distance of Mr. Chadwick's show rooms at 2, St. Mary's Street, Manchester, will have an opportunity of personally inspecting this apparatus.

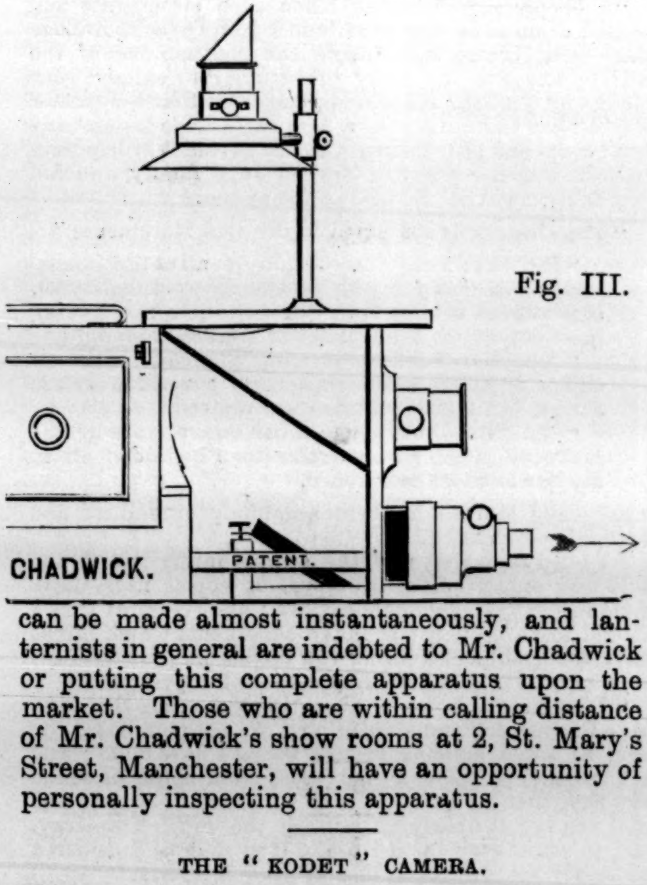


Fig. III.

### THE "KODET" CAMERA.

This is a new camera recently brought out by the Eastman Photographic Materials Company, Limited. In point of lightness it possesses all the features of the "Kodak," but is sold at a price which will put it within the reach of those who do not care to invest in one of the more expensive instruments. This new camera, "Kodet," although originally designed for glass plates, can, with the addition of the "Kodet" roll-holder, be used equally well for films. For plates, it is provided with three double holders, and for films with a roll holder for four dozen exposures. The "Kodets" are made in two styles, Fig. I. being the regular, and Fig. II. the folding, the former taking pictures 4 by 5, and the latter 3¼ by 4¼. The "Kodet" is arranged for both time or instantaneous exposures; is fitted with either a single or a double combination lens, strictly rectilineal and of great rapidity, provided with revolving stops; can be focussed by the index or on the ground glass; is fitted with finder for horizontal or vertical exposures, and the speed of the shutter is regulated by merely moving a lever. All the "Kodets" are thoroughly well made in every particular, handsomely finished, and covered with leather.

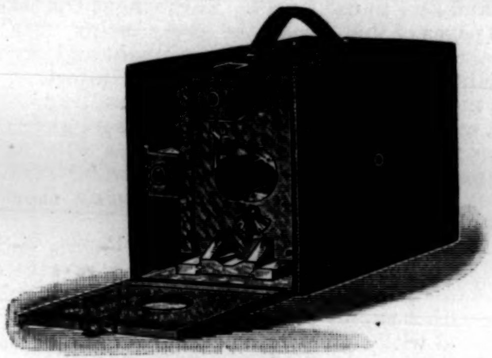


Fig. I.

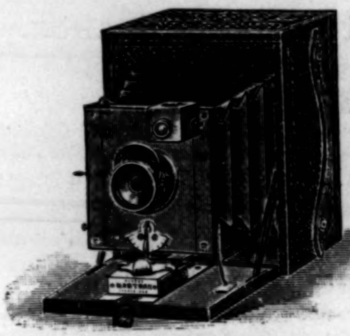


Fig. II.

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## Editorial Table.

Year Book of Photography.—This annual, which is published in connection with the *Photographic News*, is edited by Mr. T. C. Hepworth, and published by Alexander & Shepherd. Numerous articles of a practical style are given in a type of a large and clear character. Many good illustrations are also to be found in this annual for 1895, which contains in all 570 pages.

Handbook of Illustration.—London: Dawbarn and Ward, Limited.—In the preface, the author, Mr. Horsley Hinton, says: "Increased use of the photographic reproduction processes, and a prevailing ignorance of their nature and application, made desirable a simple, practical Handbook of Illustration methods. Such a book it has been my endeavour to produce" In a series of twelve chapters, Mr. Hinton gives lucid particulars written in a clear style, which, combined with a number of illustrations, makes the work a valuable one. The price is 3s. nett.

Photographic Lenses.—Bradford and London: Percy Lund and Co., 1s. 6d.—This book by Mr. John A. Hodges is to hand. It furnishes useful particulars as to how to choose and how to use lenses. Throughout the whole of the 140 pages of this book, the great pains that have been taken to make everything plain and to avoid technicalities as much as possible, are manifest.

Lantern Slides, their Production and Use.—by Mr. J. Pike, and by the same publishers and sold at sixpence, furnishes matter of much value to those who are not experts at lantern slide making, and a careful reading of this book should do much towards helping them over their troubles.

Platino-Mat Surface Bromide Paper. — From Messrs. Elliott and Son, of Barnet, we have received a supply of this paper, of both smooth and rough quality, together with a supply of Metol developer. The prints are produced with a pleasing colour and of fine gradation. This paper may be had put up in packets, either 6½ by 4¾, 8½ by 6½, 12½ by 10½, 15½ by 12½, and in fact any size, even to rolls containing 25 feet by 40 inches wide.

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## Patent Intelligence.

*The following list, relating to current Patent Applications, is compiled expressly for "The Optical Magic Lantern Journal" by a registered Patent Agent. For further information apply to S. Dicker, c/o "The Optical Magic Lantern Journal," 56, Chancery Lane, London, W.C.*

No. Recent Patent Applications.

2195. 31st January, 1895. William Houldershaw. Improved ether saturator for the production of the limelight.

2213. 31st January, 1895. James Charles Richardson. Improvements in the production of oxygen or hydrogen gas.

2305. 1st February, 1895. Frederic Eugene Ives. Improvements in photo-chromoscopes and photo-chromoscope cameras.

2687. 7th February, 1895. William Isaac Chadwick. Improvements in projection lanterns and polariscopes.

3115. 13th February, 1895. Robert Smith. Improvements in apparatus for use in binding lantern slides.

Complete Specifications Printed.

*Copies of the following specifications may be obtained by remitting 1/- for each specification to S. Dicker, "Optical Magic Lantern Journal," 56, Chancery Lane, London, W.C.*

2462 of 1894. Timberlake Saturator for optical lanterns.
23152 of 1894. Brier and others. Pressure gauges.
24821 of 1894. Grottendreck. Magic lantern apparatus.

## HANFSTAENGL v. TYLER.

When one has just written out a large cheque to foot the bill for damages and law costs for a case he has lost, it is not wise to rush into print with his views of the case, for the £ s. d. sting is apt to make one make assertions on the spur of the moment, which, on a calmer occasion, he would not think of doing. Mr. Walter Tyler is no exception to this rule, and when the "calmer moment" came, he regretted the move he had made. With reference to his letter which appeared in our last issue, he thus writes and apologises to Mr. Hanfstaengl :—

"Sir,—I beg to tender you my most sincere apology for the insertion in various trade journals of statements of a libellous nature made by me, reflecting on your action in the recent proceedings in the Queen's Bench Division of the High Court of Justice, in which you obtained substantial damages against me for the manufacture, sale, and letting out to hire, of magic lantern slides, copied from six of your Copyright works.

"I deeply regret having made such statements and caused them to be published, and I desire to acknowledge that both before and during the continuance of the action, you gave me every opportunity to satisfy your claims by a proper acknowledgment, and that the matter might have been settled at a very early stage before any legal costs had been incurred, by the payment of less than half the amount which a Special Jury finally awarded you as damages on the trial of the action.

"The allegations contained in my said statements"—

"(1). That I made any enquiry at all at Stationers' Hall to ascertain if your said works were registered, and was led to copy them through their not having been entered on the register or marked Copyright.

"(2). That I offered twelve guineas, with all slides, negatives, and scraps in my possession before action, but this submission was refused.

"(3). That I was put to unnecessary costs by the proceedings being continued after I had done all in my power to make amends.

"are each and all of them absolutely groundless and without justification.

"I fully recognise, now, the serious injury which the sale and exhibition of my spurious copies must have done to your valuable publications ; and I regret that I should have been led to make statements which might have the results of injuring you further in your business as a publisher and extensive owner of copyrights.

"I beg to thank you for accepting the enclosed cheque for a Charity connected with art, to be nominated by you, as some amends for the wrong I have done ; and acknowledging the fair and reasonable spirit in which you have met me throughout this matter, I desire to add that you are at liberty to publish the present apology, and to make such further use of it as may be considered necessary for the protection of your interests."

——:o:——

Two statements of a legal character which were referred to in Mr. Tyler's original letter, but are not alluded to in the apology, may as well be here corrected.

(1). It is not the fact that "an Englishman's production must be copyright and registered in Germany as well as his own country"; on the contrary there is no registration at all in Germany for works of art, and it has been established by Mr. Hanfstaengl in other cases that the basis of the Berne Convention being "*reciprocity* between the different countries of the Union, it is sufficient to comply with the requirements of *the country of origin* of a work, so that in the case of an English work, registration *here* would secure full copyright throughout all the countries of the International Union.

(2). It is not the fact that the Empire living pictures case was lost, on the contrary it has only been before the Court on an application for interim injunction, on a particular point, and the trial is yet to take place some two or three weeks hence, when all the issues which are so important to copyright owners are to be fully discussed.

——o:——

## Correspondence.

### SAFETY OF SATURATORS.

*To the Editor.*

Sir,—Will you kindly allow me space for a few words in reference to Mr. J. G. Parvin's letter in your current number? I have been very busy of late and have only had time to run hastily through your paper, much as it interests me, so I had not seen in it the paragraph to which Mr. Parvin refers; but it must be from a letter which I wrote to Messrs. Perken, Son & Rayment in November last. That letter was not by any means only or chiefly on "the safety of the Optimus Saturator." In it I did mention as one of the advantages—safety—though ot course there are several others which are perfectly safe. Mr Parvin may like to know that when I wrote those words about "others which are perfectly safe," I referred to the Gridiron, Timberlake's and Lawson's. There may be many others besides. I have tried all these and with regard to the Gridiron I consider it a very good, well-finished, and efficient article (though it has not a monopoly of these qualifications), and I have before now recommended it to one whose lantern work was not quite like my own. But the real point about the Optimus lies in a nutshell, I think, and it is simply this, that the saturator and the jet are not all one apparatus, so that one has the choice of the jet to be used. This means a great deal. The price of a really high-class chamber jet by a first-rate maker is about the same as the price of some saturators with jets complete. I gave 50s. for my chamber jet. Now any practical lanternist knows, I think, that with the same two cylinders of compressed gas, one of these high-class chamber jets will give a better light than will one of cheaper construction, however good of its class the latter may be. Is it possible for any one to give as good a jet, with a highly finished and expensively made saturaror thrown in, for the same price (at any rate within a few shillings), as a really first-class chamber jet costs without saturator? I therefore use the Optimus that I may, by putting to it a first-class chamber jet (I use one of Archer's, of Liverpool), get that extra amount of light which one would get equally out of the jet if one were using compressed coal gas instead of ether.

Since I wrote to Messrs. Perken, Son & Rayment last November, I have tried an experiment with their Optimus which may interest some of your readers. I set up two lanterns (Archer's Ideals) each fitted with one of Archer's best chamber jets, which Mr. Archer says will produce 800 candle-power. I believe that he is right, but have not tested them with a photometer. I first connected the jets with cylinders of compressed coal gas, and developed the utmost light that I could in one lantern (a friend worked the other). Then I disconnected the coal gas from the jets and substituted in each lantern the saturator, with the same jets (working both the saturators myself, as my friend was unused to them). There was no doubt whatever that in both cases the light produced by the saturators was fully as powerful as that produced with the compressed coal gas; in each case it was a magnificent light, but the saturator could fully hold its own with the compressed gas.

Mr. Parvin will understand, I hope, that I write in no spirit of hostility to him, for I believe the Gridiron Saturator to be very good value indeed. But as I have given a good deal of time and thought to the subject of saturators, there may be some who will be interested in my conclusions. Where economy in original cost must be studied, one cannot do better probably than use a Gridiron or similar saturator. But where there is so much lantern work to be done that an addition to the initial cost is not of the same consequence, my own experience is that I can do best with detached saturators with a first-class chamber jet.

Apologising for trespassing thus on your space,  
I am,  
Yours faithfully,  
ERNEST H. SHEARS.

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*To the Editor.*

Sir,—Perhaps the record of one of the numerous experiments to test safety of saturator I have made may still further inspire confidence in their use. I did not stop short of bursting, which was done as follows:—

I filled a "Timberlake" Saturator with saturine (a mixture of light hydro-carbons) and placed it in an iron oven and heated it till the metal turned colour, gradually increasing it till about 2,000 lbs. pressure was obtained, when the bottom passed and allowed the hydro-carbon to escape, which of course instantly lighted, but beyond that no damage was done to the saturator. I may say that we only make our containers to stand a pressure of 1,800 lbs. and have never in use been able to develop 6 lbs. pressure internally. We have not submitted ours to any expert, but shall be pleased to place one at the service of any expert or scientist to test. But I have often placed the full pressure of a newly-filled oxygen cylinder on ours without detriment.

The above refers to my ordinary No. 1. Saturator, cast vessel. The seamed copper vessels will only stand about one-third of the pressure, but even then it is ample, and I don't think any well constructed saturator is likely to burst.

Yours truly,  
T. TIMBERLAKE.

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*To the Editor.*

Sir,—As there has been some correspondence in your columns with reference to the safety of the newer ether saturators, we think it necessary to say, as the owners of the patent rights in the Lawson saturator that no accident, nor any circumstance in the nature of an accident has been brought to our notice, although nearly a thousand are now in the hands of the public. On the other hand, we have numerous letters from scientific gentlemen who have, quite unasked, examined the construction of the apparatus and satisfied themselves as to its safety, in which they say that they cannot see how any accident could possibly happen.

Although we do not know the construction of all the modern saturators, and therefore cannot speak with certainty for more than our own, we are inclined to think that any mishap which may have occurred in the operating of such apparatus, however alarming it may have appeared, would not be really dangerous, and would be directly traceable to some mistake on the part of the operator. So far as we are concerned we can only say we have endeavoured to produce an explosion or to cause a mishap by every experiment we could think of and have utterly failed.

Yours truly,
Bradford, Yorks. RILEY BROS.

*To the Editor.*

SIR,—Kindly allow me to endorse the remarks of Archdeacon Shears, *re* the safety of the "Optimus" saturator. I have personally experimented with the "Optimus" in every way, and found it absolutely reliable and safe, and to give in conjunction with certain jets a light far more powerful than any other saturator I have yet seen. No one need have the slightest fear in using saturators of undoubted workmanship, such as the "Optimus," the "Lawson," and the "Gridiron." With the "Optimus" there are no automatic arrangements to depend upon, but it is worked with a mixed jet like the ordinary oxy-hydro.

Thanking you for the favour of insertion,
Yours faithfully,
Bristol. J. HENRY JONES.

## DIAGRAMMATIC SLIDES.

*To the Editor.*

SIR,—In preparing diagrammatic slides for science lectures, illustrated by the lantern, I have recently adopted the following plan:—

A weak solution of Canada balsam in benzene is poured over one side of a plain glass slide and allowed to dry. The diagram is then drawn on the coated side of the glass with a fine pen and ordinary black ink, and the slide mounted in the usual way.

This method is so cheap and yet so effective that I think some of your readers would be glad to know of it. I have not previously seen it described.

I am, Sir, Yours faithfully,
A. GODFREY DAY.
Bath City Science, Art and Technical Schools,
19, Green Park, Bath.

—:o:—

## Notes and Queries.

*C.S.S.*—Wesleyan Sunday School Union, Ludgate Circus Buildings, E.C. Band of Hope Union, 60, Old Bailey, E.C.

*Copyright.*—The note you speak of had reference to a party taking an original negative from Nature—not a negative from some picture. As far as we can learn in the present state of copyright law, you can only claim for infringement which takes place after it has been registered, so that if the party did not sell or exhibit after the registering, what he copied before, you cannot claim. After registering, it might be well to notify the offender; write to Stationers' Hall for a registration form (one penny), fill this up according to requirements, attach a print of the picture and send to Stationers Hall. The fee for registration is one shilling.

*H. A. Tulloch* writes: I have in my possession a set of coloured slides of the Russo-Turkish war (1887), but have no reading. I would be much obliged if you would inform me where I could purchase such a reading.

*E. G. P.*—The etho-oxo is generally considered to be a trifle behind the mixed jet, and it depends a good deal on the nature of the lime. If you will refer to page 183 in our issue for last November you will see a tabulated list of the results of a number of experiments in connection with various jets,

*M. Houldenshaw.*—As soon as we obtain particulars of your new saturator we shall be pleased to call attention to it. Could you send us one?

*T. E. F.*—1. 4½. 2. Double form. 3. Rigid is the best; or, failing that, a style that can be firmly clamped when in position.

*C. Parker.*—1. We find that the "Optimus" will not hold a charge of 12 ozs.; this was evidently a misprint. We think 6 ozs. should do, but give it time to soak in. If you blow out all you can in the manner suggested you will not have enough left to last the time required. 2. If you are using too much direct oxygen, you will only obtain an indifferent light. And when the supply of ether is reduced to such an extent that it will not thoroughly saturate the gas, then will it be necessary to turn off more or less the supply of direct oxygen, and this is the stage at which you will get a pop when turning the light out. 3. Wood's jet is made by Mr. Wood, of Cheapside, whose advertisement you will find on our second page.

*W. de Frere* writes: "At various times I have seen it stated that oxygen saturated with ether is non-explosive, Is this correct?"—Yes, it is when it is not thoroughly saturated, that it is explosive. In the saturator you mention, the pop occurs because the supply is more or less exhausted. You will observe that if you put out the light when well charged, say soon after lighting, that this will not occur. The remedy is to put in a bigger charge at the commencement. We do not know whether the makers of your saturator still advocate putting in the small quantity they at first suggested, but we found out long ago that it was too little. Try five or six ounces, remembering that all saturators of the same external size do not all hold the same quantity, as that to an extent is governed by the quantity of packing that has been forced in.

*Limelight.*—You give neither name nor address, so we cannot give you the information, as we do not let anonymous communications have attention.

*E. H. B.*—If oxygen is forced into the gas mains it forms an explosive mixture, and is all right so long as it is kept there, shut up, but if you turn on say a bracket in the house, and this mixed gas presents itself, it, by reason of the small pressure behind it, will, so to speak, fire back, and the amount of damage is governed by the quantity of the mixture; given enough of it, it will blow up the pavement. Such an accident occurred some years ago, we believe, in Tottenham Court Road. This, and our article to which we referred you last month, covers the whole matter. No special work is devoted to the subject.

*Lantern Designer.* — Platt and Witte, R. R. Beard F. Brown, A. Clarkson. The addresses of each will be found in our advertising pages.

*A. B. S.*—(1) Any ink that is a non-copying ink will answer; fasten with paste, and give the paper a coat of size before varnishing. (2) Any quick drying varnish, such as French polish, will do.

*G. H. Padgham.*—You can obtain the very thin silvered glass for optical work from Mr. Platt (late Platt & Witte).

*Rev. J. G. Sanderson.*—Your letter has been sent to the writer of the article.

Several articles are held over for want of space.